



November 2009



# ManTech

Affordability for  
Defense Weapon Systems

Report Documentation Page				Form Approved OMB No. 0704-0188	
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1. REPORT DATE <b>NOV 2009</b>		2. REPORT TYPE		3. DATES COVERED <b>00-00-2009 to 00-00-2009</b>	
4. TITLE AND SUBTITLE <b>ManTech Affordability for Defense Weapon Systems</b>				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) <b>Office of the DEputy Under Secretary of Defense for Advanced, Systems &amp; Concepts., Office of Technology Transition, Washington, DC</b>				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT <b>Approved for public release; distribution unlimited</b>					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT <b>Same as Report (SAR)</b>	18. NUMBER OF PAGES <b>24</b>	19a. NAME OF RESPONSIBLE PERSON
a. REPORT <b>unclassified</b>	b. ABSTRACT <b>unclassified</b>	c. THIS PAGE <b>unclassified</b>			





ACQUISITION,  
TECHNOLOGY  
AND LOGISTICS

**DIRECTOR OF  
DEFENSE RESEARCH AND ENGINEERING**

3040 DEFENSE PENTAGON  
WASHINGTON, DC 20301-3040

FROM: DIRECTOR, DEFENSE RESEARCH AND ENGINEERING

Our Nation's defense and technology industrial base remains the most innovative, reliable, and cost-effective in the world. The Department of Defense (DOD) Manufacturing Technology (ManTech) Program helps maintain this position with its focus on critical manufacturing technology development, acceleration of technology insertion into manufacturing processes, and creation or expansion of critical production facilities and direct production capacity towards affordably meeting the most urgent Warfighter needs.

This brochure highlights key impacts of products implemented by the Army, Navy, Air Force, Missile Defense Agency, and Defense Logistics Agency. The pages of the brochure show the on-going benefits of the ManTech Program to provide cost savings, reduce manufacturing lead time, provide faster surge capabilities, improve technology implementation using Manufacturing Readiness Levels (MRLs), improve manufacturing processes for greater reliability, and meet Warfighter technology requirements. The centerfold of the brochure highlights the 2009 ManTech Strategic Plan. It reflects the efforts of the Joint Defense Manufacturing Technology Panel (JDMTP) that facilitated government and industry collaboration with key stakeholder inputs. The plan provides strategic thrusts to guide processing and technology solutions and active support to meet broader defense needs such as a strong defense manufacturing infrastructure and workforce of the future.

The customer, that is the Warfighter, Program Executive Offices (PEO), Program Managers (PM), and sustainment and logistics providers, support and endorse the products implemented by the ManTech program as seen throughout the brochure and as stated in specific quotes. Some of these products include enhanced combat helmets, affordable shipbuilding processes, more powerful and efficient turbine engines, and improved combat rations.

I am pleased that the ManTech team's approach is consistent with the DDR&E current goals to accelerate delivery of technology capabilities to win the current fight, to build strategic relationships to prepare for an uncertain future, to reduce cost, acquisition time, and risk of major defense acquisition programs.

A handwritten signature in black ink, appearing to read "Zachary J. Lemnios", is positioned above the printed name.

Zachary J. Lemnios

# MISSION STATEMENT

***The DOD Manufacturing Technology (ManTech) Program anticipates and closes gaps in manufacturing capabilities for affordable, timely, and low-risk development, production and sustainment of defense systems.***

An important focus of ManTech is on the technologies, processes, and enabling manufacturing capabilities that reduce the acquisition and sustainment cost of weapon systems and provide direct benefit to the Warfighter. Measures of effectiveness include Return-On-Investment, improved mission capability, improved readiness, and reduced mission/Warfighter workload. Timely transition of the technology consistent with acquisition and operational requirements is essential.

The ManTech Program:

- Provides the crucial link between technology invention and industrial applications
- Matures and validates emerging manufacturing technologies to support low risk implementation in industry and DOD facilities to include depots and shipyards
- Addresses production issues from system development through transition to production and sustainment
- Addresses production issues early by providing timely solutions
- Reduces risk and positively impacts system affordability by providing solutions to manufacturing problems before they occur

The principal program stakeholders and participants include the Director of Defense Research and Engineering (DDR&E) and the Acquisition and RDT&E communities within the Army, Navy, Air Force, Defense Logistics Agency, and Missile Defense Agency. The program is executed with a wide range of organizations, including prime contractors, subcontractors, suppliers, hardware and software vendors, industrial consortia, centers of excellence, universities, and research institutes as well as collaboration with the Department of Commerce (DOC), and the Department of Energy (DOE).

In summary, the DOD ManTech Program vision is a responsive, world-class manufacturing capability to affordably and rapidly meet Warfighter needs throughout the defense system life cycle.



## CUSTOMER ENDORSEMENTS

# Keeping the Warfighter Ready... What are they saying?

*"The U.S. Army helmet technology project was a 'win/win' ... ManTech helped the industry provide the capability to produce an improved helmet at lower cost and helped the Soldier because now they have great helmet to give them great ballistic protection at not a lot of weight!"*

BG Peter Fuller, PEO Soldier; Commanding General,  
Natick Soldier System Center

*"ManTech focuses on improving quality, on improving efficiency and reducing costs. ManTech and the CORANET worked together to provide the funding and experts to get a project from the initial concept to full development and implementation."*

Colonel Brad Hildebrand  
DLA Warfighter Rations Advisor



*"I'm a big supporter of ManTech... it's a way to put smart applications and technology into production and make a difference in the way we build Navy ships."*

Rear Admiral Dave Johnson  
Deputy Commander for Undersea Technology and  
Commander for Naval Undersea Warfare Center

*"Our partnership with ManTech ensures the affordability and availability. We minimize the risk in going from development to manufacturing by making an investment in the manufacturing processes."*

LTC Ed Stawowczyk  
Product Manager, Army FLIR  
Program

*"The power of the ManTech program is that you can take a relatively small amount of up-front investment, combine it with the expertise from the ManTech labs, and generate long-term production cost savings."*

Colonel James P. Ryan  
Director, F-35 Production







# ***ManTech Improves Warfighter Protection***

## **The Problem:**

The current U.S. headgear manufacturing processes are inadequate for a new generation of improved helmet ballistic materials.



## **ManTech Response:**

- Army ManTech invested \$5.7M and leveraged the Small Business Innovation Research (SBIR) Program and the North American Technology and Industrial Base Organization (NATIBO) to demonstrate high-pressure molding, preforming and thermoforming techniques not currently available in the helmet industrial base
- Implemented cost effective processes to manufacture enhanced thermoplastic-based, ballistic fiber reinforced helmets with increased ballistic performance and uniformity
- ManTech program cited by Army and Marines as one of two key enablers for the development of the new Enhanced Combat Helmet (ECH)

## **Impacts:**

- Increased ballistic fragmentation protection by over 30% (from 9mm frag protection)
- Reduced the amount of manual labor for assembly from 30% to 10% by automation
- Reduced tooling time from 15 minutes to 5 minutes
- Reduced scrap/waste of expensive ballistic fibers by over 60%
- Cost avoidance is estimated at \$83M

**Implemented by PEO Soldier in FY09 through a production decision for over 200,000 helmets**



# ***Advanced Manufacturing Propulsion Initiative (AMPI) Will Decrease Costs by Over \$3B***

### **The Problem:**

Advanced turbine engine designs using composite materials provide lighter weight, durability, and cost savings for next generation aircraft such as the F-35. However, composites have been limited to the “cold section” of jet engines (e.g., fan blades, fan cases, etc).



*F135/F136 Engine /  
F-35 Lightning II*



*T700 Engine /  
MH-60M Blackhawk*

### **ManTech Response:**

- Air Force ManTech and DMS&T invested \$30.3M and leveraged SBIR and other sources to introduce heat resistant, lightweight composite components into the “hot section” of a jet engine
- The GE Rolls-Royce Fighter Engine team developed and implemented third-stage, low-pressure turbine vanes made from ceramic matrix composites (CMC)

### **Impacts:**

- Enables jet engines to run at higher thrust due to less cooling required of the heat resistant composites
- Increased range, speed, acceleration, fuel efficiency and loiter due to engine improvements and weight savings
- Enabled advanced upgrades to current gas turbine engines for millions of gallons of fuel savings

**This program is projected to decrease production and maintenance costs by over \$3B for the F135, F136 and T700 turbine engines**

***Air Force ManTech, NAVAIR, Army, Pratt & Whitney, General Electric, Rolls Royce, University of Dayton Research Institute, General Dynamics Information Technology, Defense-Wide Manufacturing Science and Technology (DMS&T) + 25 other partners***



# ***ManTech Reduces Cost of T-Beam Stiffeners for DDG 1000 with Hybrid Laser Arc Welding***

## **The Problem:**

T-Beam stiffeners, used extensively for decks, bulkheads, and other ship structures, are being manufactured with stronger materials of reduced thickness to save weight. Conventional welding of these thin materials results in significant distortion requiring extensive rework. Distortion accounts for an estimated 30% of the structural cost of a ship.



*Close-up photo is an HSLA-80 web welded to an HSLA-80 flange using hybrid laser arc welding  
(courtesy Applied Thermal Sciences)*

## **ManTech Response:**

- A Navy ManTech project team invested \$1.9M with \$2M of industry cost share to develop and validate a hybrid laser arc welding (HLAW) process for fabricating HSLA-80 T-Beams with less distortion for DDG 1000 Class ships
- The HLAW process combines the deep penetration and high speed of laser welding with the gap tolerance of conventional gas metal arc welding (GMAW)

## **Impacts:**

- Better fit-up during shipyard construction, resulting in higher throughput
- 45% fabrication cost reduction due to higher weld speeds, less time required to set up the weld, and less labor required to straighten beams after welding
- Applicable to other platforms including the Littoral Combat Ship
- HLAW process technically approved for HSLA-80 T-Beam fabrication for DDG 1000

**Reduced the structural cost  
by \$600K per ship**

***Navy Metalworking Center, PMS 500, NAVSEA, NSWC-Carderock,  
Bath Iron Works, Northrop Grumman Shipbuilding, Applied Thermal Sciences***





## ***ManTech Reduces Lead Time and Cost of Forging Dies***

### **The Problem:**

Forging dies are used to produce high performance parts across multiple weapon systems. Conventional machining of die steels for forging tools is slow and expensive. Typically, lead-times for large, complex shapes are 15 weeks with costs for some forgings exceeding \$40,000.



*UH-60M Blackhawk Helicopter  
die tool manufactured part*



### **ManTech Response:**

- The DLA Forging Program invested \$972K with industry cost share of \$988K to enable the implementation of a new paradigm for forging tooling known as Rapid Solidification Processing (RSP). Instead of removing metal to form the forging die, the process is additive, using spray technology to build the die around a form.
- RSP has produced dozens for forging dies for commercial and defense applications, making short run forgings feasible at Manufacturing Readiness Level 9

### **Impacts:**

- Reduced production lead time of forging dies from 15 weeks to 6 days
- Reduced direct cost from \$2,000 to \$300 per die
- Reduced material cost from \$20,000 to \$6,000 per die
- Increased die size from 3" diameter to 9" diameter, allowing production of a greater variety of dies

**Overall cost benefits of this  
program exceed \$14.3M**



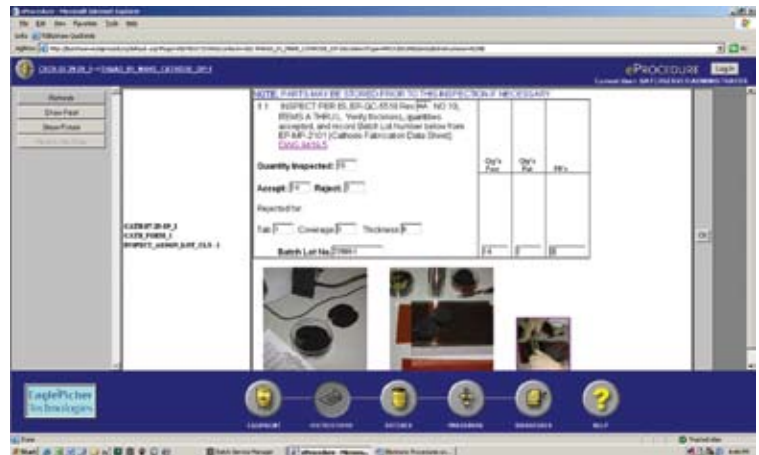
# ***ManTech Improves Production Process of Mission-Critical Batteries for Greater Reliability***

## **The Problem:**

Highly-specialized lithium batteries are used to power MDA kill vehicles and require hand assembly which is prone to errors and rework. These mission-critical batteries must perform reliably or else battery failure may cause catastrophic misfires and misguided missiles.



*Kill Vehicles such as the PAC-3 are dependent on the reliability of highly-specialized lithium batteries*



*Example battery assembly instruction screen with single step instruction, embedded pictures, and graphical hyperlinks to the large view native application*

## **ManTech Response:**

- The MDA Producibility and Manufacturing Program invested \$2.3M to identify critical steps that improve assembly processes
- EaglePicher provided \$300K cost-share funding to modify and adapt an industry-standard computer aided manufacturing process documentation solution
- Demonstrated a new automated traveler system with actual battery production

## **Impacts:**

- Reduced frequency of assembly errors and enhanced assembly instructions for battery fabrication processes
- Avoids rework and failure reviews
- Maintains personnel skill sets in lithium assembly process even during production gaps and expected attrition losses of skilled personnel

**Improved manufacturing processes assure reliable batteries for missile defense systems**



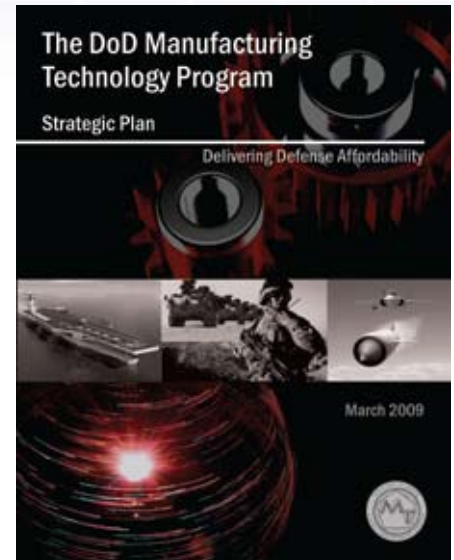


## REPORT TO CONGRESS

# 2009 DoD ManTech Program Strategic Plan

### Background

The 2009 Manufacturing Technology (ManTech) Program Strategic Plan was prepared by the Office of the Secretary of Defense, in close collaboration with the Joint Defense Manufacturing Technology Panel (JDMTP). The full Strategic Plan, delivered to Congress in April 2009, can be viewed or downloaded from the DoD ManTech Program Web Site at <https://www.dodmantech.com/>. Some highlights from the plan are presented on these two pages.



### Strategic Thrusts and Goals

Over the next five years, the DoD ManTech Program strategy is to balance its traditional emphasis on processing and fabrication technology solutions with active support to meet broader defense manufacturing needs.

21st century defense manufacturing will rely on a networked, collaborative and increasingly global supply base, with capabilities that can be linked within and among all stakeholders – from developer to user to sustainer – to respond rapidly to dynamically changing defense needs.

The challenge facing the DoD ManTech program is to address the wide ranging military needs for system affordability, timely delivery and performance. The plan contains four strategic thrusts with supporting goals and actions associated with attaining results.

### **Strategic Thrust 1: Effective Management and Delivery of Processing & Fabrication Technology Solutions**



- A coordinated investment process to effectively manage manufacturing technology development and transition across organizational and programmatic seams
- Timely and effective delivery of defense-essential processing and fabrication technology solutions, coordinated within joint service portfolios

## ***Strategic Thrust 2: Active support for a highly connected and collaborative defense manufacturing enterprise***



- Innovative, enterprise-level ManTech initiatives enabling collaborative and network centric manufacturing
- Robust dissemination of ManTech Program results throughout the Defense Industrial Base

## ***Strategic Thrust 3: Active support for a strong institutional focus on manufacturability and manufacturing process maturity***

- Effective policies and practices to assess and improve manufacturing readiness
- Full integration of “Design for Manufacturability” across the defense acquisition cycle
- Structured analysis of manufacturing cost drivers for ManTech emphasis, in partnership with PEOs and Industry



## ***Strategic Thrust 4: Active support for a healthy, sufficient and effective defense manufacturing infrastructure and workforce***



- Active promotion of investment and innovation in manufacturing infrastructure and management systems
- Effective ManTech contribution to a highly capable, well educated defense manufacturing workforce

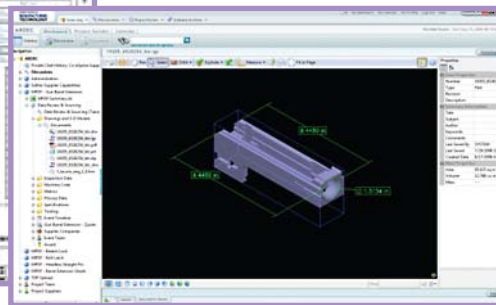
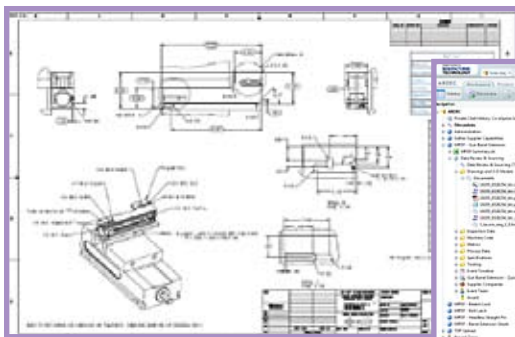




# ***ManTech Uses Model-Based Enterprise to Reduce Lead Time for Machined Spare Parts of Legacy Systems***

### **The Problem:**

The lead time to manufacture replacement parts for legacy systems used in recent conflicts is too long. Manufacturing improvements are needed to update the engineering, manufacturing setup, and purchase order administration to prevent delays in getting these critical spare parts delivered to the Warfighter.



2-D Drawings to 3-D computer models enable  
M2 machine gun replacement parts to be manufactured quickly

### **ManTech Response:**

- The Defense-Wide MS&T Program invested \$1.5M to demonstrate Model-Based Enterprise (MBE) through a comprehensive software data package that electronically communicates 3D part dimensions and associated manufacturing requirements to potential suppliers
- The MBE tools reduced time for legacy system parts by enabling the supplier to reduce their startup time, manufacture parts quickly, and assure that the parts are right the first time

### **Impacts:**

- Reduced time from start to first-article-inspection by 46% for 3 suppliers of M2 machine gun parts
- Increased the number of suppliers willing to bid, increasing capacity and competition
- Demonstrated that the faster production methods are broadly applicable to machined replacement parts for all legacy systems

**Reduced lead time by 60% to  
meet a critical Warfighter need**



# ***ManTech Improves Micro-Displays for Warfighter Capability***

## **The Problem:**

Future Army imaging programs will rely on high resolution sensors and displays to replace the current capabilities. Current displays are too expensive and do not meet the performance requirements for the Warfighter's imaging systems, and manufacturability is low.



*Production of 1280 x 1024 color micro-display on an 8" production line reduced cost & enables the Warfighter increased mobility, detection, and situational awareness*

## **ManTech Response:**

- Army Manufacturing Technology invested significantly to improve manufacturing and reduce electrical and optical manufacturing defects for active matrix liquid crystal displays
- Optimized the deposition angle during the manufacturing process
- Established a qualified manufacturing line and improved the manufacturing yield
- Demonstrated improved manufacturing capability of MRL-8

## **Impacts:**

- Improved performance through better uniformity across the wafer
- Reduced 1280x1024 display cost from \$5000 to \$1000 per unit
- 4X increase in production yield
- Anticipated production will exceed thousands of units

**Enabled Enhanced Night Vision Goggle – Digital (ENVG-D) system to meet manufacturing and performance parameters**





# ***ManTech Expedites Procurement Process for Thousands of Cast Spare Parts***

### **The Problem:**

Cast spare parts drive the level of backorder parts due to old technical data, lost tooling, and difficulties identifying capable contractors. These problems result in increased lead times and costs, and a reduction in supply chain response.



*"The Latch Bar for SINCGARS Radio was previously sole sourced 15,000 @ \$47.49/each. The Procurement Solutions Network for Castings located a supplier who provided 16,000 @ \$37.50, for a cost savings of \$159,840"*  
– Ryan Moore, Non-Ferrous Founders Society



### **ManTech Response:**

The DLA invested \$1.2M with \$520K in industry cost share for the Procurement Solutions Network Database for Castings. This network simplifies the procurement process by providing access to available castings tooling and capable suppliers. Currently the data base contains over 20,000 tooling records from 123 suppliers valued at \$140M.

### **Impacts:**

- Reduced lead times from 16 weeks to 4 weeks
- Over 2,400 solicitations have been directed to over 85 suppliers resulting in actual cost savings of over \$1.4M
- Increased domestic supply base of qualified suppliers not previously included in part solicitations
- Increased numbers of bids on solicitations and reduced number of "no-bid" solicitations
- Average cost savings resulting from using existing "tooling" is 13% from the previous purchase

**Over the life of the program,  
efficiencies exceed \$4M in savings**

***DLA ManTech, Defense Supply Centers Richmond and Columbus,  
Non-Ferrous Founders Society, Advanced Technology Institute***



# ManTech Scales-Up Transparent Spinel Armor

## The Problem:

Glass-plastic based transparent armor is growing prohibitively heavy to meet new Warfighter requirements. Transparent armors based on ceramic spinel have been shown to reduce weight by 33% to 50%, but current fabrication capability is inadequate for tactical vehicle requirements.



*Driver side windshield is a spinel-based transparent armor*



## ManTech Response:

- Army Manufacturing Technology invested \$7.9M to develop a new manufacturing capability enabling production of spinel armor through hot pressing and hot isostatic pressing

## Impacts:

- Produced high optical clarity, spinel armor plates for tactical vehicles
- Demonstrated ballistic protection for tactical vehicle platforms defending against Long Term Armor Strategy (LTAS) objective threats
- Increased manufacturing capability from 200 square inches (14 in x 16 in) flat spinel armor windows to 600 square inches (16 in x 40 in)

**Cost benefits are projected at  
\$68M for spinel windows**





# ***ManTech Reduces Cost of Components for Active Electronically Scanned Array (AESA) Radar***

### **The Problem:**

The AESA radar operates with an extremely fast scanning rate and much higher range providing a major battlefield advantage over conventional radar. Because of its complexity, an AESA radar is very costly and extremely difficult to build. Demand for these systems are high and projected to increase in the coming years.



### **ManTech Response:**

- Air Force ManTech invested \$19.4M to implement Lean Value Stream Mapping and used Integrated Product and Process Development to identify manufacturing cost drivers of current generation AESA radars
- Air Force worked with primes and sub-tier vendors to reduce costs by maturing the processes and manufacturability of AESA materials and components

### **Impacts:**

- Implemented fully-automated 3D probing system to combine three tests (pre-seal, oscillation, and final electrical) into one test head
- 50% reduction in associated touch labor for the radiator stick assembly by revising a connector masking process
- 85% reduction in RF manifold manufacturing process steps
- 8% increase in yield as the result of a circulator manufacturing process improvement
- Provides Warfighter with next generation radar technology with improved performance at a reduced cost

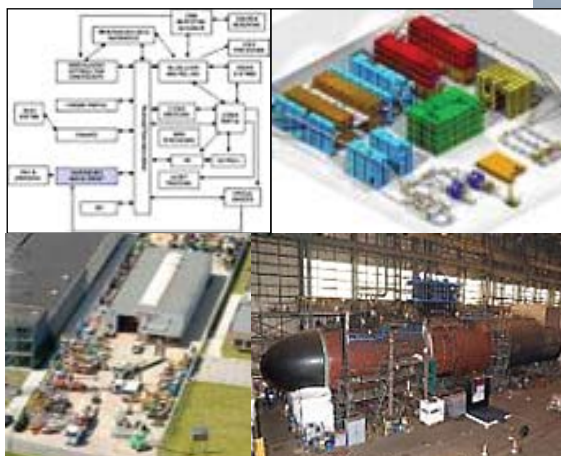
**Cost avoidance of \$380M estimated  
over the life of the program**



# ***ManTech Improves Material Logistics and Reduces Cost for VIRGINIA-Class Submarines (VCS)***

## **The Problem:**

Current practices for the flow of materials to large shipyards result in unacceptable levels of lost or damaged parts. Thirty percent of the cost of submarine construction is directly related to material procurement and logistics management, so overall construction cost of the VIRGINIA Class Submarine (VCS) may be reduced with improved material logistics.



*More efficient material management processes decrease overall VCS costs*



## **ManTech Response:**

- Navy ManTech invested \$1.4M with Electric Boat to establish a world-class material flow system to reduce overall construction cost of the VCS
- A future vision and strategy for material logistics was developed by benchmarking “best-in-class” companies to identify process excellence in material flow techniques
- Electric Boat implemented a material flow system with improved material procurement, scheduling, storage, handling, tracking, and delivery functions

## **Impacts:**

- Reduced lead time of material delivery
- Increased material availability at build site
- Reduced material costs by \$1.4M per hull
- Reduced labor costs of \$4.0M per hull

**Total cost reduction of \$5.4M per hull incorporated in VIRGINIA Block III Contract (Dec 08)**



# ***American Recovery and Reinvestment Act (ARRA) –***

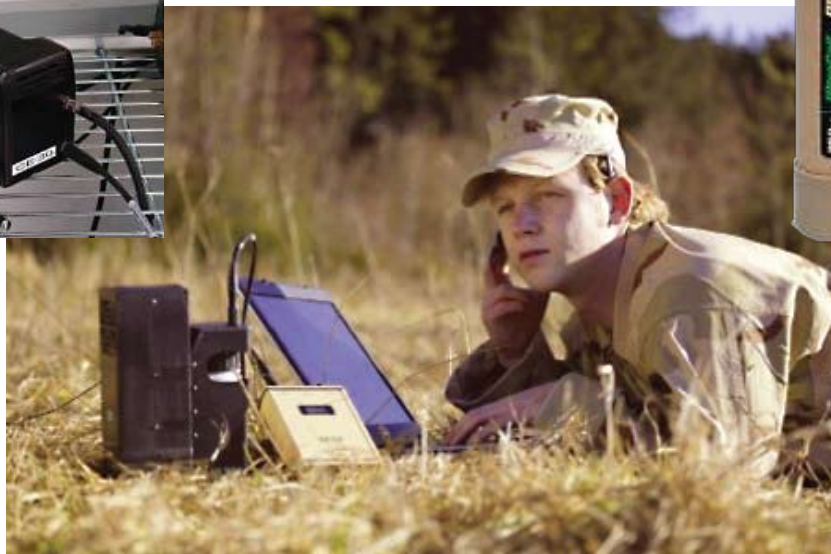
## ***Fuel Cells for Energy and Supply Distribution***

### **Fuel Cell Manufacturing Technology: \$18.4M Investment**

- Follow-on to success of 2008 DOD Wearable Power Challenge
- Reduces the reliance on non-rechargeable batteries
- Working to address gaps identified in the JDMTP Power and Energy Roadmap
  - 300 Watt Squad Level Fuel Cell Charger to support Ground Soldier System
  - 50-60 Watt Soldier Portable Fuel Cell System to support Air Force ATD
- Success of the program will:
  - ✓ Result in the tactical use of fuel cells
  - ✓ Be utilized by the Army, Air Force and Marines
  - ✓ Result in establishment of a viable domestic production base
  - ✓ Create a synergy between commercial and military applications



*Technology  
example*



*Technology  
example*

**“For any mission over 48 hours, it will  
take weight off the soldiers back”  
- PM SWAR (Soldier Warrior)**



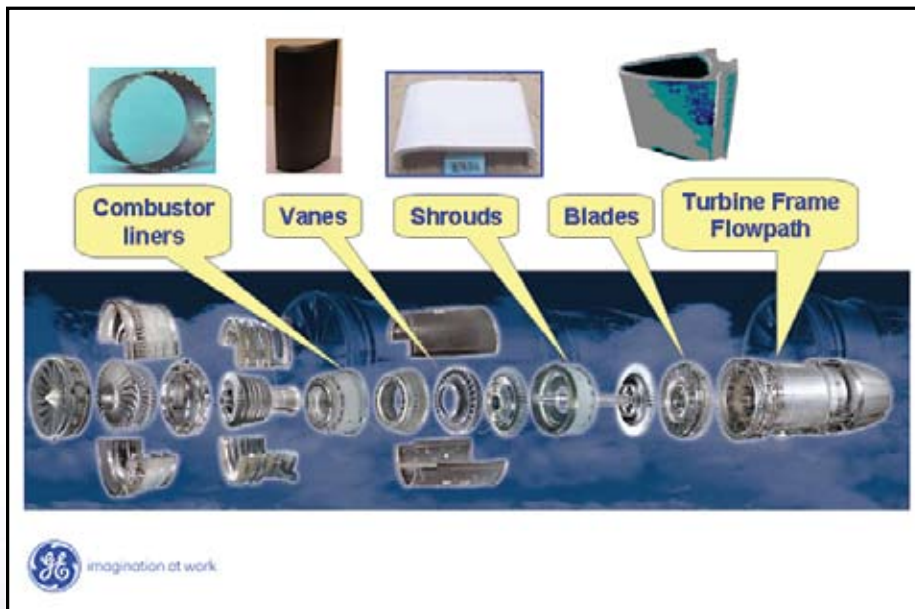
# Energy-Related Manufacturing Initiative



## Fuel Optimization For Mobility Platforms

### Ceramic Matrix Composites: \$4.86M Investment

- Ceramic composites for advanced turbine engines reduce the need to siphon power for cooling, leaving more power for increased thrust and other critical performance requirements
- Improved nondestructive evaluation (NDE) technologies will result in increased yields and quality, while reducing costs and process times
- Data and models linking measurable defects parameters to performance will increase the service life of components and improve field inspection minimizing unexpected maintenance actions
- Ceramic matrix composites enable engines to run hotter at reduced weight, thereby reducing specific fuel consumption by 2.75% for the F-35 Joint Strike Fighter engine and 2% for the UH-60 Helicopter engine



**Higher temperature components enable more efficient engines and less energy and logistics cost**



## Industrial Based Innovation Fund

Starting in 2008, Congress appropriated an Industrial Base Innovation Fund (IBIF) to address current industrial base shortfalls that negatively impact Warfighter requirements. DLA was chosen to execute this program under the DoD ManTech funding line. The 2009 contract awards are listed below. DLA and the JDMTP Subpanels monitor all IBIF projects to ensure successful implementations that will strengthen the Defense industrial base.

<i><b>Title</b></i>	<i><b>Company</b></i>
Automated Assembly of U.S. Military Optics	Keystone Applied Technologies
Mass Fabricated Micro-Initiator Boards for Gun Launch MEMS-based S&A Devices	Tanner Research, Inc.
Integrated Circuit Emulation Manufacturing Design Capability Improvements	Sarnoff
Integrated Circuit Emulation Manufacturing Test Capability Improvements	Sarnoff
Manufacturing Capability for Spray Cooled Vehicle Power Control and Distribution System	Isothermal Systems Research, Inc.
U.S. Based GaN Limiter MMIC Supplier for Naval & Ground Based Radars	Lockheed Martin
Advanced Process Engineering for Cost-Effective Composite Battery Manufacturing of 6T Microcell batteries	Firefly Energy
Development and Implementation of a Fast Braze Process for Aero Engine Components	Woodward FST Inc.
Intensive Quenching Technology for Critical Artillery Components	NexTec Corporation
Incremental Sheet Forming for Aging Department of Defense Asset Sustainment	The Boeing Company
Development and Transition of Optimized Transformation Process for ATI 500-MIL Auto-Tempered High Hard Steel	National Center for Defense Mfg.& Machining
Preservation and Manufacturing of Legacy Components	Rolls-Royce
Cost-Effective Grinding of Nickel-Based Alloys for Quality Production of Propulsion and U.S. Defense Weapon Systems Components	TechSolve, Inc.
Implementation of Innovative Metal Casting Technologies To Lower DoD Procurement Costs and Reduce Lead Times	buyCastings.com

Additional information on the IBIF program is available at: <https://www.dodmantech.com/ibif/>

# DOD ManTech - Did You Know?

- DOD ManTech developed the original numerically controlled machine tool and the associated programming language, APT, in the 1950's to advance military aircraft manufacturing. Now used globally in countless manufacturing applications.
- The DOD ManTech program developed the technology that became the foundation for the current microelectronics industry in the 1960's.
- In the 1970's, DOD ManTech developed processes for the production of the forerunners of precision laser guided missiles and munitions.
- In the 1980's, DOD ManTech developed a process for reverse engineering thousands of obsolete microcircuits that support weapon systems still in service. Use and mission benefits continue to expand today.
- In the 1990's, the DOD ManTech program developed magneto-rheological finishing for advanced military optics. The process is now also used by all manufacturers of photolithographic optics.
- In the current decade, DOD ManTech:
  - Provided revolutionary electronics such as Micro Electro-Mechanical Systems (MEMS) for field artillery systems and Focal Plane Arrays (FPAs) for sensor systems
  - Enabled manufacturing of interceptor body armor currently used by our forces
  - Manufactured next generation of enhanced combat helmets to replace 30-year old technology
  - Developed automated processes for lighter, durable and more comfortable composite prosthetics
  - Provided improved combat rations with high quality, safer, and surge-capable production
  - Implemented higher power, longer duration batteries across weapon systems
  - Applied model-based manufacturing and CAD in aeronautical and maritime construction for greater affordability

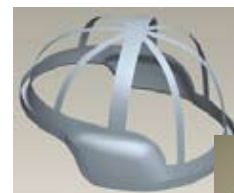
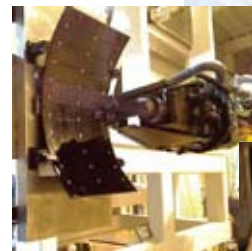
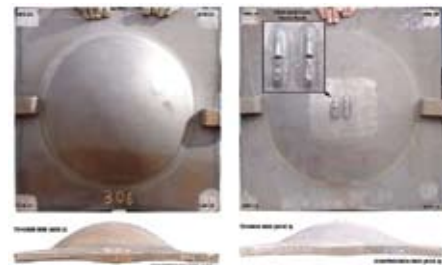




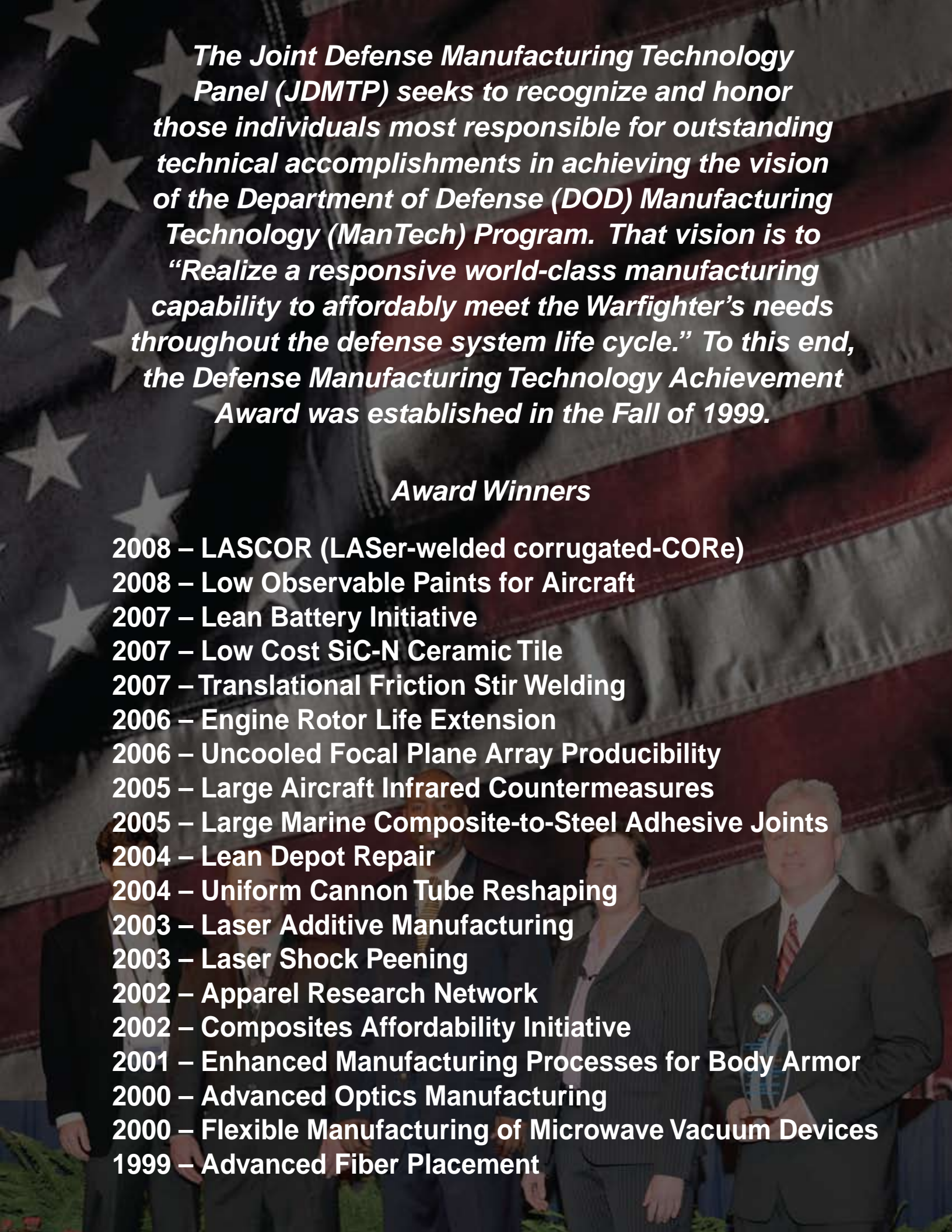
# 2009 Defense ManTech Achievement Award Nominations

There were 12 nominations submitted through JD MTP Subpanels for the 2009 Defense ManTech Achievement Award. The winners were announced at the Defense Manufacturing Conference. The JD MTP Principals would like to recognize these nominees for their efforts.

<b>Project Title</b>	<b>Service</b>
* Improving Sheet Metal Affordability for the Virginia Class Submarine	Navy
Development of Friction Stir Welding for Expeditionary Fighting Vehicle (EFV) Hull Components	Navy
Procurement Solutions Network for Cast Parts	DLA
Affordable Manufacturing for DDG1000 Helo Hangar & Integrated Deckhouse Composites	Navy
VCS Material Management	Navy
DoD Power Source Technology Roadmap	Army
* HSLA-115 Evaluation and Implementation for CVN 78	Navy
* Low Cost Manufacturing of Materials for Improved Warfighter Protection	Army
Current Generation Active Electronically Scanned Array (AESA) Improvements	Air Force
* Terminally Guided Robots and Robotic Applications in Confined Spaces: F-35 Inlet Duct Robotic Drilling (IDRD)	Air Force
Digital Heads-Up Displays (DHUD) Reflective Microdisplay Device Manufacturing	Navy
Model Centric Design	Army



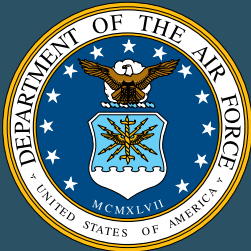
\* *Finalist*



***The Joint Defense Manufacturing Technology Panel (JDMTP) seeks to recognize and honor those individuals most responsible for outstanding technical accomplishments in achieving the vision of the Department of Defense (DOD) Manufacturing Technology (ManTech) Program. That vision is to “Realize a responsive world-class manufacturing capability to affordably meet the Warfighter’s needs throughout the defense system life cycle.” To this end, the Defense Manufacturing Technology Achievement Award was established in the Fall of 1999.***

### ***Award Winners***

**2008 – LASCOR (LASer-welded corrugated-CORE)**  
**2008 – Low Observable Paints for Aircraft**  
**2007 – Lean Battery Initiative**  
**2007 – Low Cost SiC-N Ceramic Tile**  
**2007 – Translational Friction Stir Welding**  
**2006 – Engine Rotor Life Extension**  
**2006 – Uncooled Focal Plane Array Producibility**  
**2005 – Large Aircraft Infrared Countermeasures**  
**2005 – Large Marine Composite-to-Steel Adhesive Joints**  
**2004 – Lean Depot Repair**  
**2004 – Uniform Cannon Tube Reshaping**  
**2003 – Laser Additive Manufacturing**  
**2003 – Laser Shock Peening**  
**2002 – Apparel Research Network**  
**2002 – Composites Affordability Initiative**  
**2001 – Enhanced Manufacturing Processes for Body Armor**  
**2000 – Advanced Optics Manufacturing**  
**2000 – Flexible Manufacturing of Microwave Vacuum Devices**  
**1999 – Advanced Fiber Placement**



**For Further Information**  
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**November 2009**